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The Mineral Industry of Pakistan

UNITED STATES DEPARTMENT OF THE INTERIOR

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The Mineral Industry of Pakistan

By Charles L. Kimbell[1]

The year 1987 was one of growth for major components of Pakistan's modest mineral industry. The gain in crude oil production, miniscule in comparison to those of the past 3 years, was disappointing in that it contributed little to the country's drive for energy materials self-sufficiency. However, a 20% gain in coal production and a 4.7% growth in natural gas production were noteworthy improvements in Pakistan's efforts to reduce its dependency on imported energy materials.

International problems beyond the borders of Pakistan had a demonstrable impact on civil order within Pakistan, and hence on industrial activity, including that of the mineral industry. The Iran-Iraq war spilled over well beyond the Persian Gulf into the streets of Karachi, Pakistan's most populous city and the center of its industrial activity, with shootouts between pro- and anti-Khomeni factions of sufficient magnitude to disrupt the travel of workers to and from their jobs. These firefights, coupled with other breakdowns in civil order that apparently were of an internal nature, were described in local press accounts as having a measurable effect on industrial activity. On several occasions, a significant part of the work force simply stayed home to avoid being killed. Similarly, air raids by the Soviet-backed military forces of Afghanistan, directed at those areas of Pakistan near the Afghan border where an estimated 3 million displaced Afghans are housed in refugee camps, certainly contributed to a climate far less than ideal for industrial growth and development.

On a more positive note, it was reported that the Geological Survey of Pakistan earmarked about $8.4 million[2] for implementation of a mineral exploration and deposit evaluation program in Baluchistan Province.

PRODUCTION

In broad perspective, Pakistan's mineral industry upped its output in 1987 relative to 1986 performance. Gains by such operations as the country's single integrated steel plant, the majority of its cement plants, the fertilizer industry, and all three major components of the country's fuel industry (coal, natural gas, and petroleum), more than balanced shortfalls by some of the other components of the industry.

Table 1.—Pakistan: Production of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1983	1984	1985	1986[p]	1987[e]
METALS					
Aluminum: Bauxite, gross weight	3,161	2,720	1,759	2,881	3,447
Antimony ore:					
Gross weight	--	6	24	--	45
Sb content[e]	--	1	4	--	7
Chromium: Chromite:					
Gross weight	5,959	2,997	5,188	8,299	9,963
Cr content[e]	1,966	989	1,712	2,739	3,288
Iron and steel:					
Pig iron[e] thousand tons	472	566	803	892	903
Steel, crude[e] do.	550	619	700	800	910
Lead, refined, secondary[e]	1,000	1,000	1,000	1,000	2,000
Manganese ore:					
Gross weight	--	8	155	625	--
Mn content[e]	--	2	41	[r]190	--
INDUSTRIAL MINERALS					
Abrasives, natural: Emery	1,689	1,393	4,630	4,972	3,060
Barite	26,018	27,230	29,932	39,047	10,031
Cement, hydraulic[2] thousand tons	4,938	4,697	[r e]5,229	[r e]6,130	6,832
Chalk	2,217	1,360	2,082	2,192	4,292
Clays:					
Bentonite	667	1,740	1,611	1,282	2,537
Fire clay	87,740	79,528	68,537	87,522	122,513
Fuller's earth	21,136	19,139	10,647	15,228	18,045
Kaolin (china clay)	12,834	11,711	6,644	37,056	32,208
Other	87,000	130,000	285,000	520,000	395,000
Feldspar	5,280	5,468	5,633	11,575	6,675
Fluorspar	336	2,724	3,175	4,353	3,673
Gypsum, crude	318,000	375,000	409,000	373,000	448,000
Magnesite, crude	1,998	4,153	2,113	1,757	3,740
Nitrogen: N content of ammonia	1,098,400	1,127,700	1,106,800	1,154,400	1,179,000
Phosphate rock	--	--	--	50,000	32,000
P_2O_5	--	--	--	16,000	10,000
Pigments, mineral, natural: Ocher	1,077	1,046	553	608	1,792
Salt:					
Rock thousand tons	571	598	583	576	485
Marine do.	[e]189	[e]180	269	242	308
Total do.	[e]760	[e]778	852	818	793
Sand and gravel:					
Gravel	234,000	74,000	16,000	--	11,000
Sand:					
Bajri and common	[e]131,000	294,397	352,496	136,964	208,339
Glass	90,000	100,000	202,000	115,000	149,000
Sodium compounds, n.e.s.:					
Caustic soda[3]	40,096	[r e]40,600	[r e]52,300	[r e]54,000	56,571
Soda ash, manufactured	102,000	[e]121,000	118,087	130,894	133,133
Stone:					
Aragonite and marble	116,000	80,000	62,000	168,600	229,000
Dolomite	92,874	121,750	121,578	136,271	141,856
Limestone thousand tons	4,194	5,184	6,685	6,339	7,279
Other (reported as "ordinary stone") do.	[e]385	525	366	677	571
Strontium minerals: Celestite	135	564	718	997	1,663
Sulfur:					
Native	628	926	877	890	1,120
Byproduct, all sources[e]	25,700	26,000	26,000	[r]26,000	26,000
Total[e]	26,328	26,926	26,877	[r]26,890	27,120
Talc and related materials: Soapstone	15,956	15,568	20,183	23,021	32,905
MINERAL FUELS AND RELATED MATERIALS					
Coal, all grades thousand tons	1,859	2,134	2,199	2,025	2,444
Coke do.	[e]345	[e]533	556	630	633
Gas, natural:					
Gross production million cubic feet	343,504	352,933	366,282	392,485	410,849
Marketed production (sales) do.	328,000	331,108	345,000	[r e]370,000	388,000
Natural gas liquids[e] thousand 42-gallon barrels	45	45	55	[r]65	70
Petroleum:					
Crude do.	4,954	6,534	12,522	15,065	15,230
Refinery products:[3]					
Gasoline do.	[r]4,845	[r]5,457	5,738	5,865	7,012
Jet fuel do.	[r]3,744	[r]3,792	3,712	3,944	3,712
Kerosene do.	[r]1,860	[r]2,000	2,379	3,209	3,015
Distillate fuel oil do.	10,010	[r]10,004	11,473	13,152	13,040
Residual fuel oil do.	9,718	[r]10,216	10,250	11,382	11,655

See footnotes at end of table.

Table 1.—Pakistan: Production of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity		1983	1984	1985	1986[p]	1987[e]
MINERAL FUELS AND RELATED MATERIALS —Continued						
Petroleum: —Continued						
Refinery products:[3] —Continued						
Lubricants	thousand 42-gallon barrels	721	r742	875	980	1,005
Other	do.	3,083	r2,592	3,217	3,526	3,615
Total	do.	33,981	34,803	37,644	42,058	43,034

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Table includes data available through Aug. 10, 1988.

[2]Pakistan's official reporting is on the basis of fiscal years beginning July 1, of each year; the Pakistan Federal Bureau of Statistics revised cement figures upward for the years beginning July 1, 1984, July 1, 1985, and July 1, 1986, but did not provide revised monthly figures for the first 2 years. Hence the undistributed additions to production fiscal years have been apportioned calendar years. For this reason, the results for calendar years 1985 to the appropriate and 1986 have been classified as estimates. Similar revision in officially reported production data necessitated revisions of calendar year data to an estimated basis for 1984, 1985, and 1986.

[3]Refinery fuel is not reported separately; presumably it is included in the quantities reported for the various fuel types, chiefly residual fuel oil.

TRADE

In 1986, the most recent year for which comprehensive trade data are available, Pakistan recorded a net commodity trade deficit of $1,993 million, $1,159 million less than its 1985 total commodity trade deficit of $3,152 million. Corresponding trade-deficit figures for mineral commodities alone were $1,150 million in 1986 and $1,846 million in 1985, for a deficit reduction of $696 million. Reduction in the net outflow of funds both for total trade and mineral commodities were to a significant extent the result of a reduction in the value of mineral fuel imports, although there were declines in the values of imports for several other commodity groups as well.

Among mineral commodity imports, fuels remained dominant, at $765 million, accounting for over 58% of the total in 1986, but this compared with $1,433 million in 1985, which approached 74% of the total. The next most significant mineral commodity import groups were iron and steel, valued at nearly $207 million in 1986, slightly below the 1985 level of $213 million; and manufactured fertilizers, valued at almost $150 million in 1986, almost 37% above their 1985 level of $109 million.

Among mineral commodity exports and reexports, manufactured fertilizers were the largest major group in 1986, accounting for almost 51% of the total and substantially ahead of mineral fuels (chiefly refinery products), which accounted for almost 24%, and iron and steel with 12%. This represented a significant shift from the pattern in 1985 when iron and steel ranked first with 30%, fuels ranked second with 23%, and manufactured fertilizer ranked third with 19% of the total.

The following tabulation summarizes the value of mineral commodity trade for 1985 and 1986, and provides data on the value of total commodity trade for comparison in million U.S. dollars:

	1985	1986
Mineral commodities:		
Exports	r$101.6	$161.9
Reexports	r.4	.4
Total	r102.0	162.2
Imports	1,948.4	2,311.8
All commodities:		
Exports	2,707.6	3,302.9
Reexports	31.1	81.1
Total	2,738.7	3,384.0
Imports	5,890.4	5,376.8

[r]Revised.

In 1986, 8% of Pakistan's mineral commodity exports and reexports by value went to developed market economy countries, 59% to developing market economy countries, and 33% to centrally planned economy countries. Corresponding 1985 export figures were 28%, 62%, and 10%. These results may be compared with the distribution of total export trade for 1986, as follows (1985 results in parentheses): developed

market economy countries, 56% (50%); developing market economy countries, 40% (42%); and centrally planned economy countries, 4% (8%). On the import side of mineral trade, 38% of the total value came from developed market economy countries, 60% from developing market economy countries, and only 2% from centrally planned economy countries; 1985 figures were 23%, 75%, and 2%, respectively. For comparison, 1986 results for total import trade (1985 results in parentheses) were as follows: developed market economy countries, 64% (55%); developing market economy countries, 31% (41%); developing market economy countries, 64% (55%); and centrally planned economy countries, 5% (4%). The sharp changes, both in mineral commodities and total commodities, away from developing market economy countries in favor of the other areas chiefly were the result of the drop in mineral-fuel-import values from the developing nations.

Pakistan's trade with the United States has been less significant in terms of mineral commodities than in terms of total trade. Among exports and reexports, the U.S. share of total commodity trade was 11% in 1986, up 1% over the 1985 level, but in both years, the U.S. share of total mineral-commodity exports was less than 1%. The United States provided 13% of Pakistan's total commodity imports in 1986, 1% below the 1985 level. Among mineral commodities, the United States acccounted for 11% of the 1986 value, a notable increase over the 6% level of 1985. This was primarily the result of an increase of nearly $43 million to $116 million, in the value of manufactured fertilizer imports from the United States.

In the 1985 edition of this chapter, it was reported that Pakistani authorities had indicated that rising internal demand for fertilizer in 1986 consumed much of the production that had been an exportable surplus in 1985; however, published trade results showed a $64 million upturn in manufactured fertilizer export values in1986, although the value of imports of these materials also increased significantly. Manufactured fertilizer exports grew from $19 million to $83 million, while imports increased from $109 million to $150 million.

Table 2.—Pakistan: Exports and reexports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986	
			United States	Other (principal)
METALS				
Aluminum: Metal including alloys:				
Scrap	61	15	...	All to Japan.
Unwrought	2	—		
Chromium: Ore and concentrate	10,264	21,223	...	China 25,598; Sweden 5,625.
Copper: Metal including alloys:				
Scrap	8,607	810	...	Japan 532; United Kingdom 271.
Semimanufactures	46	—		
Iron and steel: Metal:				
Scrap	1,718	20,507	...	Japan 20,264.
Pig iron, cast iron, related materials	144,170	133,444	...	Sweden 52,500; Bangladesh 37,231; China 24,363.
Steel, primary forms	...	59,504	...	Japan 38,579; Belgium-Luxembourg 15,028.
Semimanufactures:				
Bars, rods, angles, shapes, sections	2,381	818	...	Sri Lanka 790.
Universals, plate, sheets	72	230	...	India 222.
Wire	113	134	...	Iran 100; Greece 34.
Tubes, pipes, fittings	8,264	714	...	Afghanistan 533; United Arab Emirates 108.
Castings and forgings, rough	...	4	...	All to United Arab Emirates.
Nickel: Metal including alloys, scrap	166	4	...	All to United Kingdom.
Silver: Ore and concentrate:				
value, thousands	...	$2,212	...	China $1,146; Sweden $1,066.
Uranium and or/thorium: Metal including alloys, all forms do.	...	$562	...	All to Sweden.
Zinc:				
Oxides	...	10	...	All to United Arab Emirates.
Metal including alloys, scrap	41	—		
Other:				
Ores and concentrates	5,785	100	...	All to Sweden.
Ashes and residues	250	—		
Base metals including alloys, all forms	...	17	...	All to United Arab Emirates.

See footnote at end of table.

Table 2.—Pakistan: Exports and reexports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS				
Abrasives, n.e.s.: Grinding and polishing wheels and stones	1	1	(2)	Mainly to Bangladesh.
Asbestos, crude	--	2	--	All to Bangladesh.
Barite and witherite	50	--	--	
Clays, crude	131	100	--	Do.
Fertilizer materials:				
Crude, n.e.s.	223,620	213,594	--	United Arab Emirates 207,332; Qatar 5,500.
Manufactured: Nitrogenous	507,203	173,003	--	Iran 78,550; Bangladesh 52,453; China 42,000.
Gypsum and plaster	1,500	60	--	All to Kuwait.
Mica: Crude including agglomerated splittings	--	10	--	Do.
Precious and semiprecious stones other than diamond:				
Natural value, thousands	$1,105	$4,839	$496	Hong Kong $3,088; West Germany $413; Switzerland $360.
Synthetic do.	$20	--	--	
Salt and brine	9,417	18,409	500	India 12,505; Rwanda 2,142.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	7,106	5,617	39	Japan 1,064; Italy 640; Bangladesh 503.
Worked	--	20	--	All to United Kingdom.
Dolomite, chiefly refractory-grade	--	350	--	All to Bangladesh.
Gravel and crushed rock	313	395	--	Do.
Sand other than metal-bearing	--	3,194	--	United Arab Emirates 3,036.
Sulfur:				
Elemental: Colloidal, precipitated, sublimed	--	1	--	All to New Zealand.
Sulfuric acid	83	102	--	All to Afghanistan.
Other: Crude	1,087	20	--	All to Bangladesh.
MINERAL FUELS AND RELATED MATERIALS				
Carbon black	1,204	46	--	Sri Lanka 30; Bangladesh 16.
Coke and semicoke	--	20,000	--	All to Republic of Korea.
Petroleum refinery products:				
Lubricants:				
thousand 42-gallon barrels	--	178	--	India 133; United Arab Emirates 45.
Residual fuel oil do.	1,090	906	--	Yemen (Aden) 539; United Arab Emirates 366.
Bitumen and other residues do.	--	120	--	Republic of Korea 55; Sri Lanka 48.
Bituminous mixtures do.	--	56	--	United Arab Emirates 30.

[1]Table prepared by Audrey D. Wilkes.
[2]Less than 1/2 unit.

Table 3.—Pakistan: Imports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals	1	1	--	All from West Germany.
Aluminum:				
Oxides and hydroxides	1,815	3,007	17	China 2,204; United Kingdom 226; Japan 169.
Metal including alloys:				
Scrap	13,560	21,799	52	United Arab Emirates 5,679; West Germany 4,045; Saudi Arabia 3,071.
Unwrought	7,359	7,747	10	Bahrain 5,249; United Arab Emirates 499; U.S.S.R. 485.
Semimanufactures	7,441	7,522	72	Switzerland 993; West Germany 429; Japan 427.
Chromium:				
Ore and concentrate	--	15	--	Australia 11; United Kingdom 4.
Oxides and hydroxides	87	88	9	China 39; West Germany 16.

See footnotes at end of table.

Table 3.—Pakistan: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
METALS —Continued				
Cobalt: Oxides and hydroxides	3	13	5	Belgium-Luxembourg 7.
Copper:				
Matte and speiss including cement copper	--	9	--	All from Japan.
Metal including alloys:				
Scrap	115	209	--	United Arab Emirates 110; United Kingdom 80.
Unwrought	329	162	--	Japan 63; Belgium-Luxembourg 37; Netherlands 29.
Semimanufactures	8,327	9,984	--	Japan 5,535; United Kingdom 1,244; Belgium-Luxembourg 581.
Iron and steel:				
Iron ore and concentrate:				
Excluding roasted pyrite thousand tons	1,243	1,469	--	Brazil 419; Australia 389; Liberia 309.
Pyrite, roasted	11	--	--	
Metal:				
Scrap	150,415	147,210	73,502	United Arab Emirates 24,178; United Kingdom 16,084; West Germany 11,129.
Pig iron, cast iron, related materials	763	4,971	--	United Kingdom 4,048; Canada 399.
Ferroalloys:				
Ferromanganese	5,847	8,056	--	Switzerland 1,616; France 1,409; Norway 1,309.
Unspecified	3,078	54,575	2	Canada 39,583; Bahrain 8,280; China 4,132.
Steel, primary forms	3,498	9,562	5	Australia 8,238; Japan 743.
Semimanufactures:				
Bars, rods, angles, shapes, sections	38,442	35,106	49	Japan 22,019; West Germany 5,156.
Universals, plates, sheets	474,852	326,088	28,894	Japan 141,818; Australia 37,623; West Germany 31,545.
Hoop and strip	23,649	25,355	--	France 16,817; Japan 5,846.
Rails and accessories	17,162	12	--	All from Japan.
Wire	18,686	19,419	3	Republic of Korea 7,924; Japan 6,309; China 3,577.
Tubes, pipes, fittings	74,611	81,457	3,265	Japan 45,282; Republic of Korea 10,188; France 9,443.
Castings and forgings, rough	840	1,835	2	West Germany 678; United Kingdom 445; Turkey 278.
Lead:				
Ore and concentrate	368	205	--	All from Morocco.
Oxides	859	857	--	China 514; West Germany 245.
Metal including alloys:				
Scrap	221	210	--	Zambia 72; West Germany 45.
Unwrought	1,613	2,743	2	U.S.S.R. 1,116; United Kingdom 563; Zambia 431.
Semimanufactures	37	19	--	United Kingdom 18.
Magnesium: Metal including alloys, all forms	6	14	12	France 1.
Manganese:				
Ore and concentrate	33,184	229	--	All from China.
Oxides	1,532	1,799	9	Singapore 833; China 519; Japan 354.
Mercury 76-pound flasks	1,044	1,828	--	China 841; Algeria 609.
Molybdenum: Metal including alloys, all forms value, thousands	$60	$82	--	Netherlands $61.
Nickel:				
Ore and concentrate	8	--	--	
Matte and speiss	101	638	3	Canada 537; Philippines 75.
Metal including alloys, all forms	344	322	13	United Kingdom 148; Norway 83; West Germany 39.
Platinum-group metals: Metals including alloys, unwrought and partly wrought value, thousands	$103	$3	--	All from West Germany.
Silver:				
Ore and concentrate[2] do.	$21	$14	--	Japan $11; West Germany $3.
Metal including alloys, unwrought and partly wrought do.	$97	$75	--	West Germany $71.
Tin:				
Ore and concentrate	48	--	--	
Metal including alloys, all forms	161	617	(3)	Malaysia 555; Belgium-Luxembourg 30.

See footnotes at end of table.

Table 3.—Pakistan: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
METALS —Continued				
Titanium: Oxides	2,505	3,339	194	United Kingdom 1,941; West Germany 462; Japan 253.
Tungsten:				
Ore and concentrate	--	1	--	All from Hong Kong.
Metal including alloys, all forms value, thousands	$568	$591	--	Netherlands $472; Hungary $78.
Uranium and thorium:				
Ore and concentrate do	$132	$50	--	All from Australia.
Metal including alloys, all forms do	$14	$13	--	China $9; Switzerland $4.
Zinc:				
Ore and concentrate	1	--	--	
Oxides	302	294	--	France 170; Belgium-Luxembourg 56.
Metal including alloys:				
Scrap	1,115	--	--	
Unwrought	10,291	14,634	50	Spain 5,116; U.S.S.R. 2,349; China 1,634.
Semimanufactures	18	114	--	Spain 99.
Other:				
Ores and concentrates	178	424	--	Australia 326; China 50.
Oxides and hydroxides	(4)	--	--	
Base metals including alloys, all forms	100	78	--	Hong Kong 31; China 30; Japan 15.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	788	936	169	Netherlands 409; China 197.
Artificial: Corundum	159	64	--	France 20; Spain 18; Brazil 13.
Dust and powder of precious and semiprecious stones including diamond value, thousands	$7	$8	--	United Kingdom $5; Italy $3.
Grinding and polishing wheels and stones	484	783	4	China 412; West Germany 132.
Asbestos, crude	3,349	4,383	--	Canada 2,431; Singapore 1,647.
Barite and witherite	113	6	--	All from China.
Boron materials:				
Crude natural borates	--	77	--	All from Turkey.
Oxides and acids	348	406	--	China 345; Italy 47.
Cement thousand tons	555	132	(3)	U.S.S.R. 49; Japan 30; West Germany 11.
Chalk	6,192	7,594	--	Belgium-Luxembourg 5,305; United Kingdom 968.
Clays, crude	35,837	65,845	3,194	United Kingdom 58,706.
Cryolite and chiolite	2	1	--	All from Denmark.
Diatomite and other infusorial earth	213	143	103	Netherlands 34.
Feldspar, fluorspar, related materials	226	207	--	Italy 60; China 45; United Kingdom 42.
Fertilizer materials: Manufactured:				
Ammonia	14	24	10	United Kingdom 10.
Nitrogenous	--	65,481	--	Romania 26,756; Kuwait 24,025; Saudi Arabia 14,700.
Phosphatic	428,247	654,981	570,048	West Germany 31,474; Netherlands 28,035.
Unspecified and mixed	37,012	26,501	--	Norway 13,965; Finland 12,536.
Graphite, natural	1,238	1,959	--	China 1,088; Sri Lanka 190.
Gypsum and plaster	182	(5)	--	Mainly to Japan.
Lime	2	25,013	--	Italy 25,000.
Magnesium compounds: Magnesite, crude	942	486	70	China 168; Netherlands 67; West Germany 54.
Mica: Worked including agglomerated splittings	5	2	(3)	Afghanistan 1.
Nitrates, crude	--	46	46	
Phosphates, crude	200,843	147,975	--	All from Jordan.
Pigments, mineral: Iron oxides and hydroxides, processed	2,025	2,571	--	China 1,993; West Germany 435.
Precious and semiprecious stones other than diamond:				
Natural value, thousands	$160	$162	--	Thailand $67; Hong Kong $32; Australia $24.
Synthetic do	$6	$11	--	Austria $5; France $2.
Pyrite, unroasted	117	(6)		
Salt and brine	143	(7)		

See footnotes at end of table.

Table 3.—Pakistan: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS —Continued				
Sodium compounds, n.e.s.: Carbonate, manufactured	113	51	...	United Kingdom 27; West Germany 24.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	3,069	462	...	Italy 461.
Worked	1,171	919	...	All from Italy.
Dolomite, chiefly refractory-grade	769	1,160	...	Italy 1,049; Norway 109.
Gravel and crushed rock	97	--	--	
Quartz and quartzite	--	19	...	All from United Kingdom.
Sand other than metal-bearing	339	253	...	United Arab Emirates 173; United Kingdom 53.
Sulfur:				
Elemental:				
Crude including native and by-product	40,505	27,185	...	Kuwait 11,877; Qatar 8,142; Afghanistan 3,146.
Colloidal, precipitated, sublimed	1,629	851	...	United Arab Emirates 523; China 194; Republic of Korea 78.
Sulfuric acid	22	13	1	Norway 6; United Kingdom 5.
Talc, steatite, soapstone, pyrophyllite	876	13,658	...	China 13,457.
Ocher:				
Crude	13,895	18,830	14	China 16,044; Singapore 2,180.
Slag and dross, not metal-bearing	65	44	...	United Arab Emirates 42.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	11,804	4,514	101	Singapore 4,403.
Carbon black	681	2,132	13	Republic of Korea 1,136; China 559.
Coal:				
Anthracite and bituminous	770,141	810,234	109,919	Australia 545,676; Canada 154,499.
Lignite including briquets				
value, thousands	--	$11	...	All from West Germany.
Coke and semicoke	5	29	...	All from United Kingdom.
Peat including briquets and litter	9	--	--	
Petroleum:				
Crude thousand 42-gallon barrels	31,055	26,933	...	Saudi Arabia 18,353; United Arab Emirates 5,669; Iran 2,911.
Refinery products:				
Liquefied petroleum gas				
value, thousands	$5	--	--	
Gasoline				
thousand 42-gallon barrels	855	875	...	Kuwait 872.
Mineral jelly and wax do.	75	76	...	China 46; Iraq 17.
Kerosene and jet fuel do.	3,931	4,051	...	Kuwait 3,996.
Distillate fuel oil do.	10,449	11,777	...	All from Kuwait.
Lubricants do.	159	61	7	West Germany 22; United Kingdom 8.
Residual fuel oil do.	7	66	...	China 59.
Bitumen and other residues do.	21	(3)	...	All from Italy.
Bituminous mixtures do.	(3)	20	...	Austria 12; United Kingdom 8.

[1]Table prepared by Audrey D. Wilkes.
[2]May include platinum-group metals.
[3]Less than 1/2 unit.
[4]Revised to zero.
[5]Unreported quantity valued at $4,000.
[6]Unreported quantity valued at $275,000 imported from the United States.
[7]Unreported quantity valued at $273,000 mainly imported from Denmark.

COMMODITY REVIEW

Chromite.—Pakistan's modest chromite mining industry achieved a 20% increase in output of this important ferroalloying commodity. It was the third consecutive year in which growth was recorded. Although monthly output declined following banner months in July and August, production in the waning months was ahead of the 1986 pace.

Copper.—The Metallurgical Construction Corp. a consortium of Romanian, Finnish, Swedish, and Chinese entities, submitted a

preliminary proposal in September and a detailed proposal in December offering to build on a turnkey basis a $303 million facility over a 3-1/2-year period to bring the Saindak copper deposit into operation. The facility's design calls for the production of 16,400 tons per year of blister copper which, at least at the outset, would contain about 51,800 troy ounces of gold and 72,300 troy ounces of silver. Presumably, the latter metals would be recovered from the blister copper abroad, for the proposal seemingly did not include installation of a copper refinery. The ore mined at Saindak would also provide an exportable molybdenum concentrate, while pyrite and magnetite components of the ore would be retained in Pakistan, either for local treatment or export at some future time. The proposal was accepted by the Government of Pakistan, and at yearend, plans were in the offing for visits by a technical team to Chinese mines and metallurgical facilities.

Gold.—Although there was no reported gold output in Pakistan through 1987, there is the opportunity for such output as a byproduct, almost a coproduct, with copper, if and when the Saindak copper complex comes on-stream with its projected annual output of 51,800 ounces. The gold would be recovered abroad from blister copper produced at the Saindak facility, at least at the outset.

During the year, the reported Karachi prices for gold advanced from $467 per ounce on January 1 to over $580 per ounce on December 31, an increase of 24%; these prices were 15.5% and 19.2%, respectively, above the London prices on those dates.

Iron and Steel.—Company sources indicated that Pakistan Steel Mills Corp.'s Bin Qasim steelworks reached its rated capacity during 1987, presumably signaling that the facility passed the break-even point. For several years since the inception of operations at the country's only integrated steel plant, output has reportedly been kept in check to avoid exceeding demand. A surplus was regarded as potentially damaging to the smaller, nonintegrated, private-sector steel mills of the country and to the nation's rather substantial shipbreaking industry.

The latter emerged during the late 1970's and the early 1980's as a significant provider of scrap steel in Pakistan, a development that was paralleled in other Asian countries such as Bangladesh, China, the Republic of Korea, and Taiwan, which like Pakistan have the relatively low wages and large populations that are compatible with the labor-intensive nature of the shipbreaking industry.

However, in 1987 spokesmen for Pakistan's shipbreaking industry expressed their belief that the increases in output by Pakistan Steel had resulted in substantial overcapacity in the country. They said their industry was in a decidedly disadvantageous financial position with respect to both Pakistan Steel and the several steel rerolling plants that operate largely on imported scrap in the traditional forms. The Pakistan Ship Breakers Association alleged that this relatively poorer position was primarily the result of what they viewed as inequitable import duties and sales taxes. These charges, the shipbreakers said, had averaged 1,200 rupees (about $72) per ton over the past 3 years, for their members compared with only 41 rupees (about $2.50) per ton for the scrap rerollers.

The shipbreakers suggested that the duty structure was unfavorable not only for their industry, but for Pakistan Steel and the steel remelters as well, in comparison with scrap rerollers. They noted that the number of shipbreaking firms had declined from 200 to 70, and that the labor force employed had dropped from 30,000 to 20,000.

When the Government did not respond to the industry's formal presentation of its views, the Ship Breakers Association called a complete strike in late June which, it was claimed, led to a loss of 300,000 rupees per day for the industry as a whole. The overall effect of the industry's unsatisfactory economic situation and of the strike remained to be assessed at yearend, but assuredly there was a direct loss to the economy not only from the industry's lack of activity, but also from the lay off of 10,000 workers. Longer term effects could well include the loss of a once-prosperous industry.

Silver.—As in the case of gold, Pakistan through 1987 had no officially recorded mine production of silver, but should the Saindak copper project come into operation at its rated capacity, a production of over 72,000 ounces of silver annually can be expected. Recovery of silver at the outset of the Saindak project would be out of the country, where the gold- and silver-bearing blister copper would be refined.

INDUSTRIAL MINERALS

Cement.—At yearend, there were eight private-sector cement companies in Pakistan, each with a single plant. The public sector State Cement Corp. of Pakistan (Pvt.) Ltd., had 13 separate operating units, in-

cluding 2 that had 2 plants each. The private-sector companies, with their plant locations and available information on kiln capacities, were as follows:

Company	Plant location	Kiln capacity (thousand tons)
Anwarzaib Cement Industry	Bholari	50
Attock Cement Ltd	Hub Chowki	600
Cherat Cement Co. Ltd	Cherat	330
Dadabhoy Cement Ltd	Kalu Kohar	300
Fecto Cement	Taxila	600
Galadari Cement Ltd	Hub Chowki	NA
Pakland Cement Ltd	Dhabeji	330
Sarela Cement Ltd	Darwaza	75

NA Not available.

The operating units of the State Cement Corp. and their plants, with kiln capacities were as follows:

Company	Plant location	Kiln capacity (thousand tons)
Associated Cement	Rohri	270
	Wah	450
Charibwal Cement Co	Jhelum	540
Dandot Cement Co. Ltd	Dandot	305
Javendan Cement Ltd	Mangho Pir	600
D. G. Kahn	Dera Ghazi Khan	NA
Kohat Cement Ltd	Kohat	300
Maple Leaf Cement Factory Ltd	Iskanderabad	300
Mustenkam Cement Ltd	Hahar	630
National Cement Industries Ltd	Dandot	61
	Karachi	170
Pak Cement Co. Ltd	Daud Kel	[1]171
Thatta Cement Co. Ltd	Thatta	300
White Cement Industries Ltd	Iskanderabad	30
Zeal Pak Cement Factory Ltd	Hyderabad	1,080

NA Not available.
[1]Due on-stream by or before 1988.

The aggregate listed kiln capacity of the plants listed was 7,492,000 tons excluding the Galadari Cement Ltd. plant in the private sector and the D. G. Kahn plant in the public sector.

Rather curiously, official Pakistan; Government statistics on cement production listed output by only 18 "reporting factories" during 1987, a number difficult to reconcile with the foregoing list of plants. Official production data were revised in the February 1988 issue of the Monthly Statistical Bulletin not only for 1986, but for years back to the second half of 1984, to incorporate data for additional plants. In the revised array, the results for July 1984 through June 1985 included figures for 14 plants (13 prior to revision), the figures for July 1985 through June 1986 incorporated data for 17 plants (14 prior to revision), and the results for July 1986 through December 1987 included data for 18 plants (14 prior to revision). It would appear that further increases in the number of facilities canvassed will be necessary in order to achieve complete reporting, and the increases could be substantial, depending upon which installations have not been counted.

Cement stocks in Pakistan remained quite small relative to total demand; at yearend 1986, they totaled only 157,000 tons. Monthend stocks through the year averaged only 145,000 tons, fluctuating between a low of 114,000 tons (April 30) and a high of 175,000 tons (June 30). At yearend, stocks totaled 171,000 tons.

Fertilizer Materials.—Agriculture has remained the largest industrial sector in Pakistan in terms of gross national product, gross domestic product, employment, and export earnings. With the population at 99 million and growing at 3% per year, the Government has directed considerable attention to the nation's fertilizer industry, a key to sustaining agricultural output.

At yearend 1987, the country had nine chemical fertilizer plants in operation, five producing urea only, one producing ammo-

nium sulfate, two producing single superphosphate, and one producing ammonium nitrate, urea, and nitrophosphate. These plants, with their yearend 1987 rated annual capacities, were as follows: National Fertilizer Corp. Ltd.'s (NFC) Pak-Saudi plant at Mirpur Mathelo, 256,000 tons nitrogen in urea; NFC's Pak China plant at Haripur, 44,000 tons nitrogen in urea; Exxon Chemicals (Pvt.) Ltd.'s Daharki plant, 118,000 tons nitrogen in urea; Dawood Hercules Chemicals Ltd.'s Chichoki Mallian plant, 160,000 tons nitrogen in urea; Fauji Fertilizer Co.'s Sadiqabad plant, 262,000 tons nitrogen in urea, NFC's Pak American plant, 19,000 tons nitrogen in ammonium sulfate; NFC's Lyallpur Chemicals plants at Faisalabad, 3,000 tons P_2O_5 in single superphosphate, and at Jaranwala, 13,000 tons P_2O_5 in single superphosphate; and NFC's Pak-Arab plant at Multan, 117,000 tons nitrogen in ammonium nitrate, 41,000 tons nitrogen in urea, and 70,000 tons nitrogen in nitrophosphate. Additionally, Pakistan Steel Mills at Karachi had the capacity to produce 4,000 tons of nitrogen in ammonium sulfate as a byproduct of its steel operations.

Actual 1987 output of products on a gross weight basis (1986 results in parentheses) was as follows: ammonium nitrate, 372,934 (405,808); ammonium sulfate, 90,296 (92,127); nitrophosphate, 316,890 (316,793); superphosphate, 103,464 (106,880); and urea, 1,994,993 (1,888,450). Thus, although the output of urea advanced by 5.6%, production of nitrophosphate was only a few tons above the 1986 level, and production of the other three products fell. Nonetheless, the gain in ammonium nitrate more than compensated in terms of total nitrogen content. Plant-by-plant details on urea output indicated that three of the urea-only plants produced in excess of design capacity, the Exxon facility operated at capacity, and the Haripur plant (urea only) and Multan plant (urea works) fell slightly short of design capacity.

MINERAL FUELS

In 1987, natural gas, all domestically produced, accounted for 63.1% of Pakistan's total primary energy production of about 18.2 million tons, standard coal equivalent (SCE), far ahead of the 15.2% provided by petroleum, the 12.3% provided by hydroelectric and nuclear powerplants, and the 9.3% supplied by commercial solid fuels. The 1987 level of energy production was nearly 8.6% above that of 1986, when natural gas provided 65.1% of the total; petroleum, 16.3%; hydroelectric and nuclear powerplants, 10.3%; and commercial solid fuels 8.3%, from a total (revised) of 16.9 million tons SCE. In 1986, the most recent year for which complete energy-materials-consumption figures were available, domestic energy sources accounted for almost 65.9% of total energy consumption (excluding bunker loadings) of 25.6 million tons SCE. Of this total, natural gas accounted for 42.9%; liquid fuels, 41.6%; commercial solid fuels, 8.7%; and hydroelectric and nuclear electricity, 6.8%. In terms of SCE, about 26% of the liquid fuels consumed was produced domestically, whereas almost 63% of the commerical solid fuels consumed came from Pakistan's mines.

Coal.—An increase of 20.7% in coal output significantly raised that commodity's share of total Pakistani energy production. The change was in line with the national policy to reduce reliance on imported fuels.

Natural Gas.—During 1987, data was published on Pakistan's natural gas reserves as of July 1, 1986. Proven reserves were stated to be 11,445 billion cubic feet, or nearly 66% of the reported "original reserves." The resources total was distributed by gasfield as follows, listed in descending order of quantity, in billion cubic feet (figures in parentheses represent each field's original reserves): Sui, 4,838 (8,624); Pirkoh, 3,179 (3,470); Mari, 2,561 (44,034); others (Meyal, Khandot, Dhuenal, and Toot), 867 (1,038). The Dhulian, Hundi, and Sari Fields, with a collective original reserve of 278 billion cubic feet, were reported essentially to be depleted as of July 1, 1986. No reserve figures were provided for 14 other gasfields that have been identified.

Petroleum.—Pakistan's petroleum industry recorded output gains in both the production of crude oil and refinery products; however, the gain in refined oils, based in large part upon imported crude, was larger than that for domestic crude output, thus reflecting a growth in crude oil imports. This was clearly preferable to importing higher unit value refinery products. It was not as desirable from the viewpoint of Pakistan's foreign exchange situation as would have been a refinery increase based on domestic crude. The 1.1% growth in domestic crude oil output fell short of governmental hopes but at least was a shift in the desired direction. The glut of crude oil and attendant reduced prices on world markets worked in Pakistan's favor.

Information released by the Ministry of Petroleum and Natural Resources on field-

by-field crude oil production for July 1, 1986, to March 31, 1987, indicated that Dhurnal Field remained the country's leading producer, accounting for 36.6% of total output of Pakistan's 14 operating fields during that period. Other leading fields and their shares of the total, were Leghari, 19.7%; Tando Alam, 9.2%; Khaskeli, 8.6%; Meyal, 8.3%; Mazari (in its first appearance among producers), 5.9%; Dhabi, 5.5%; and Toot, 3.9%. The remaining 2.3% was from Balkassar, Joyamir, Ghotana, Dhulian, Finkassar, and Khuar (listed in order of volume of output). Of these minor producers, Ghotana, with 52,000 barrels, was in its first year of production, whereas Khuar, with only 3,000 barrels, has been in operation since 1915. In July 1987, the Chak Naurang Field at Chakwal was inaugurated, raising the number of operating fields to 15. At least seven more fields were listed with reserves, but these were not yet operational. They included Mazari South, Nari, Tajedi, Turk, Liari, Halipota, and Tando Muhammad Khan Taluka, and there were additional possible commercial oil finds at Thora, Sono, Chatana, Chak Naurang, and Lashari (South), all in the Sunghar and Wassi concession blocks near Hyderabad, and at Ghanghoo in the Bohin concession block.

Data of the Ministry of Petroleum and Natural Resources covering the fiscal year ending June 30, 1986, and the 9 months ending March 31, 1987, indicated that the transport sector of the economy consumed 48.3% of the petroleum products used in Pakistan during that 21-month period. Power generation used 14.2%; the industrial sector, 13.4%; households, 11.3%; the agricultural sector, 3.4%; and other government agencies (presumably including a variety of uses), the remainder. Comparison with data for the fiscal year ending June 30, 1981, shows declines in the shares of total use by the transport, agriculture, household, and government-agency sectors, and increases in the shares of use by industry and power generators. In terms of annual product consumption, there was an increase of 64% between the fiscal year ended June 30, 1981, and that ended June 30, 1986. Based on the 9-month data released, the projected consumption increase for the fiscal year ending June 30, 1987, was very small.

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[1]Senior foreign mineral specialist, Division of International Minerals.

[2]Where necessary, values have been converted from Pakistan rupees to U.S. dollars at the following rates: 1985—PRs15.928 = US$1.00; 1986—PRs16.648 = US$1.00; and 1987—PRs17.399 = US$1.00.

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